

GUIDE
TO
MEAT INSPECTION

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A GUIDE TO MEAT INSPECTION

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FOR

REGIMENTAL OFFICERS

COMPILED UNDER DIRECTIONS FROM THE QUARTER-MASTER GENERAL

(See Army orders 49 and 66 of 1891.)

BY

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CAPTAIN J. STACPOLE, D.A.A.G.,
The Leicestershire Regiment,

AND ILLUSTRATED BY

LIEUTENANT W. S. MELVILL,
The Leicestershire Regiment.



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A Guide to Meat Inspection

FOR

REGIMENTAL OFFICERS.

INTRODUCTION.

THE greater proportion of meat issued to troops consists of beef. A short description is given below of the different classes likely to be tendered by the contractor, with hints which will enable an inspecting officer to form some idea of the age and state of health of the animal, and the general condition of the flesh as presented for issue.

Beef may be roughly divided into four classes.

(1) *Home bred and killed*, comprising every kind of bull, ox, cow, and heifer.

(2) *Foreign bred (chiefly American), but killed in England*, consisting almost entirely of ox beef. It is very well fed, and generally, (having been raised from the best English stock), of excellent quality. The cost of bringing over, and the rigid inspection on arrival in this country, are sufficient protection against the importation of diseased animals, consequently there is little chance of meeting with the kind of animal which, as the term runs, has been "killed to save its life." The beasts are landed chiefly at

Liverpool, Deptford, and Glasgow. The carcasses can be distinguished only by a slight wasting of the fat due to the sea voyage, and by their length and narrowness. During a bad passage some of the animals may be thrown down or otherwise become more or less badly bruised. The carcasses of beasts which have suffered in this way will show a general discoloration, and, sometimes, even laceration of the injured part. Meat tendered in this condition should be rejected.

Some oxen which have been used for draught purposes are imported from Holland, Germany, and Denmark, but they are easily recognised by their age and poor condition.

(3) *Refrigerated beef*—that is, beef which has been killed and dressed abroad, and afterwards brought over in cool chambers kept at a temperature ranging from about 36° to 40° . This meat is of the same quality as that described under (2) as coming from America.

(4) *Frozen beef*, or beef which has been brought to this country in an actually frozen condition.

Slaughtering.—The usual mode of slaughtering at home is by use of the pole-axe. The animal having been tethered, with its head held rather low by a rope passed round the horns and thence through a ring, a blow with the pole-axe penetrates the brain and brings it to the ground. A thin pithing cane is immediately passed through the wound in the forehead up the vertebræ, or spinal canal, causing instant paralysis in the event of the animal not having been quite killed by the blow. After two or three minutes the throat is cut, and the blood allowed to flow

from the body. As soon as the blood has been drawn off the animal is flayed and disembowelled; the carcase is then slung up, and evenly divided from end to end for dressing. After the two sides have been dressed they should be allowed to hang till *rigor mortis* has set in—in other words, till the carcase is “set” or “firm.” Meat should on no account be accepted unless it has this firmness.

Signs of Age.—“When the question of age arises, the inspector should pay attention to the condition of the bones and joints. The younger the animal the softer and more vascular the bones, and the more pronounced will be the ends of the bones entering into the formation of joints. *Vice-versâ*, the older the animal the harder and more compact will be the skeleton, and the firmer will be the ends of the bones entering into the structure of the joints. Moreover, the quantity of cartilage (gristle) is always greatest in young animals, and the same is true of the connective tissue”—(Walley). In young animals the bone generally is smaller than in old, and covered at the joints with bluish gristle; the vertebræ are pink in colour, porous, and comparatively soft; the surface of the ribs is of a somewhat pink colour, both down the centre and where they become embedded in the flesh. As the animal increases in age the bones become larger, harder, and less porous; the gristle of the joints begins to disappear; and the pinkness fades away from the ribs, leaving them white and bleached.

Should the pelvic bone not show a bluish gristly appearance, care must be taken, in cases of doubt, to

EXPLANATION OF PLATE I.

The object of this Plate is to show the difference in appearance of the sexes, and the names given to the various parts of a side of beef.

	Male.						Female.
The Shank	<i>a</i>	<i>a</i>
The Pelvic or Aitch Bone	<i>b</i>	<i>b</i>
The Pelvic Cavity	<i>c</i>	<i>c</i>
The Cod Fat	<i>d</i>	<i>nil</i>
The Udder or Duct	<i>nil</i>	<i>e</i>
The Pizzle	<i>f</i>	<i>nil</i>
The Erector Muscles or Root of Pizzle	<i>g</i>	<i>nil</i>
The Kidney Fat	<i>h</i>	<i>h</i>
The Peritoneum	<i>i</i>	<i>i</i>
The Diaphragm or Thin Skirt	<i>k</i>	<i>k</i>
The Pericardium	<i>l</i>	<i>l</i>
The Pleura or Coating of the Ribs	<i>m</i>	<i>m</i>
The Vertebrae	<i>n</i>	<i>n</i>
The Brisket	<i>o</i>	<i>o</i>
The Fore Leg	<i>p</i>	<i>p</i>
The Chuck Ribs	<i>q</i>	<i>q</i>
The Gullet	<i>r</i>	<i>r</i>
The Crest	<i>s</i>	<i>s</i>

The dotted lines drawn across the hind and fore legs show where these should be cut according to the contract.

N.B.—Officers are recommended when studying this and other plates to realize as far as possible the relation which exists between the different portions of dead meat and the same parts in the animal when alive and standing. This will be found of the greatest assistance in obtaining a knowledge of the subject. If this plate be turned sideways the relation will at once become apparent.

MALE.





ascertain by careful inspection whether its absence is due to the bone having been severed with a saw instead of with a knife, or is really attributable to old age. In the former case the bone will present a rough but porous condition, and will be found to be soft ; in the latter, the bone is smooth and hard. The relative softness of the pelvic bone when sawn through, and also of the chine bones, may be easily tested with the point of a penknife. The other general conditions of age will also have to be taken into consideration.

Flesh and fat.—"The muscular tissue should be of a florid hue. In certain parts it should be free from intermixture with fat ; in others its connective tissue should be so infiltrated or intermixed with that substance as to give it a distinctly mottled or marbled appearance in section. It should be of a firm or slightly elastic consistency, tolerably dry after being exposed for a short time to the atmosphere.

* * * * The connective tissue should glisten on exposure, and be tolerably moist ; but there should be no draining of water from its meshes. It is more abundant in parts where the skin is loosely attached, as in the flanks, under the shoulder and the abdomen, and at the breast or brisket"—(Walley).

The lean parts in young, well-fed, healthy animals, after exposure to the atmosphere for some length of time, should be of a bright, clear-looking, cherry-red colour. Should the cut portion of any meat under inspection have been so long exposed as to have become black and dried up, and the general conditions be such that there is a doubt whether the meat is according to contract or not,

a fresh section should be made. As, however, raw meat freshly cut is always dark in colour, no decision should be arrived at until the air has had at least an hour to act upon it, when, if it is as it should be, the colour will have changed to that mentioned above. The lean should be flecked, or marbled, with fat. This will be more particularly the case in the lean of the loin, fore-rib, and middle rib, but will not be so apparent in the top-side, silver-side, &c. In young beasts this lean should be full of juice, and smooth and silky to the touch; in old ones it will be found to be harsh, coarse, stringy in texture, and juiceless. The absence of marbling in the parts mentioned above is a sign of age, or poverty of condition.

The fat on a carcase is a most important item in judging meat. The exterior should be covered with bright, healthy-looking fat; the pleura, peritoneum, and pelvic cavity should be well-furnished, and the kidneys encased in a solid surrounding of the same substance.

“The fat varies in colour from white to straw-colour and yellow, being whiter in colour usually in young bulls and in animals fed on corn or grass than in bullocks or cows. In animals fed on rich cakes it is sometimes of a tolerably deep yellow, as it is in certain breeds of cattle, *e.g.*, the Jersey and Guernsey. It should be firm, have a suety taste and a greasy touch; be readily combustible, and capable of resisting putrefaction”—(Walley).

Disease.—The most common signs of an animal having suffered from disease, or having terminated its existence

in a manner other than by legitimate slaughter, are a red, fevered condition of the interior, accompanied often by a general discoloration of the exterior of the carcase, and a harshness and dryness of the flesh, which will be dark in colour. These symptoms may be due to fevers, apoplexy, drowning, suffocation, the animal becoming cast, &c., &c.

Signs of wasting and old-standing diseases of the organs are a flabby, pallid, wet, or dropsical condition of the whole carcase, and a want of firmness in the buttock, rump, and flesh in general, the last being of a pale, livid colour.

In lung disease or pleuro-pneumonia there will be an adhesion of the lungs to the pleura or skin-like coating of the ribs. An examination of the pleura will reveal this, or else there will be distinct evidence of the knife having been used in an attempt to remove the traces of it. "The chest should be carefully examined with the object of detecting whether or not the operation of stripping off the pleura has been performed. Stripping of the pleura, *i.e.*, the lining membrane of the chest, is practised for the purpose of removing the traces of pleurisy or of tubercle"—(Walley).

The under-side of the diaphragm should also be carefully examined, and, if the coating of either this or of the ribs be removed, the carcase should be rejected. No weight should be given to statements to the effect that this stripping is the result of endeavours to remove the unsightly appearance caused by "over sticking" or "body sticking," otherwise, unskilful bleeding; the butcher is responsible for the skill of the men he

employs, and must be prepared to take any loss arising from their carelessness.

Care must be taken to distinguish between adhesions of portions of the lungs and natural fat growing on the pleura, and between accidental cuts with the knife and intentional stripping. The cavity of the chest, too, should always be carefully examined ; the eye will thus soon become accustomed to a healthy appearance, and, after a while, anything of an abnormal character will be easily detected.

General hints on inspection.—Meat tendered for inspection should be ordered to be hung up ; it will then hang more or less as shown in the plates, whereas by lying on a flat surface it is thrown out of shape, and, one side being hidden from view, the judging becomes much more difficult. When meat is hung up it can be easily seen on all sides, and there is no need to resort to handling to turn it round. It may safely be assumed that where anything of a doubtful nature exists it will be found on the under-side.

The sex of the animal under inspection should be ascertained. No mistake can well be made if the various points of difference referred to further on are carefully studied.

As no two animals are exactly alike it must not be expected that each one submitted for inspection will have every point developed to the extent shown in the illustrations, but there will always be a large majority agreeing with one type or the other. The plates are taken from typical subjects. In some instances the distinguishing points are slightly exaggerated, and

the colouring deepened, in order to give them more force.

It should be remembered that the touch is a most valuable aid in judging the quality of meat, the coarseness or stringiness of the texture in the flesh of a bull or aged animal being easily detected by passing the thumb or finger gently over the cut surface of the lean.

When it has been decided that the outward appearance of the meat is in accordance with the contract the quarters may be cut through where the dotted lines are shown in Plate I. Should there be any sign of putrefaction it will be evident here. Meat smelling in the least sour or putrid should be at once rejected. Furthermore, care should be taken that "the strictest cleanliness in the matter of the hands and clothes of those who have the conveyance of carcasses from place to place, and of the wrappers, baskets, hampers, boxes, or vehicles in which they are so conveyed" (Walley), is observed.

When reading the following chapters the specifications of the contract as applicable to each heading should be clearly understood.

The specifications are not inserted in this book, as they are liable to slight variation, but they can always be seen hanging in the meat store, or can be obtained at the Orderly Room.

EXPLANATION OF PLATE II.

This Plate is intended to give some idea of a prime well-fed piece of ox beef.



OX AND BULL BEEF.

The ox from two to six years of age will present, in a gradually lessening degree as he increases in years, those characteristics of youth already mentioned in the preceding chapter. The bone will gradually harden and become less porous, the gristle at the joints will decrease in quantity, and the pinkness fade from the ribs. By the ninth year all the signs of youth will have disappeared and the lean instead of being soft and silky to the touch will have become tough and stringy. As a rule there will be a marked deficiency in the quantity of fat, and the carcase in general will present a gaunt, angular; and ill-conditioned appearance.

The bull, and "stag" (an animal that has been castrated imperfectly or late in life), are distinguishable from the clean-cut ox chiefly by the size of the erector muscle, pizzle, and pelvic bone; the absence of a plentiful supply of "cod" and "kidney" fat; a general massiveness of the bony structure and muscular development; and an almost entire absence of that coating of fat on the exterior of the carcase which is usually present in well-fed beef.

In the endeavour to pass a hind quarter of a bull for that of an ox, butchers sometimes resort to the very transparent fraud of extracting the stone and stuffing the cavity with fat, in order to make the cod fat resemble that of an ox.

A young bull that has not been used for stock purposes may when dressed have at first sight the appearance of an ox; but a closer examination will show, though in a

less marked degree, most of the characteristics of the adult bull. The fat, though more plentiful than in the full-grown bull, will be of a distinctly whiter colour than that of the ox.

No matter how well a bull is fed, the proportion of fat to lean is very considerably less than in the ox. In fact an old bull has hardly any fat at all on his carcase, and what there is will be found almost entirely on the hind quarters.

The texture and colour of the lean are also most important aids in the detection of bull beef. The lean will be very coarse and stringy in texture, dark in colour, with an absence of juice, while the marbling, or flecking, of fat referred to in the general introduction will not be present. There will be a marked difference *in the touch* of the flesh as compared with good ox beef. When felt under the thumb and finger the fibrous nature of the texture and a tough almost india-rubbery consistency will be distinctly apparent. The neck (or collar) of the bull is furnished with a thick coarse crest—the quarters on the other hand are narrower and slighter than those of the ox. “In the bull the textures of the sternum (brisket) are much coarser, harder, and darker in colour than in the ox or cow. The contour of the arm muscles is more perfect and they are better developed; but in the ox they are comparatively fine if castration has been performed for any length of time”—(Walley).

The following tables, I. and II., which should be carefully studied with the plates, show, at a glance, the particular points to which attention should be paid when judging a hind or fore quarter of a male beast, with a view to distinguish bull from ox :—





EXPLANATION OF PLATE III.

This Plate shows the distinguishing points of a hind quarter of ox and a hind quarter of bull.

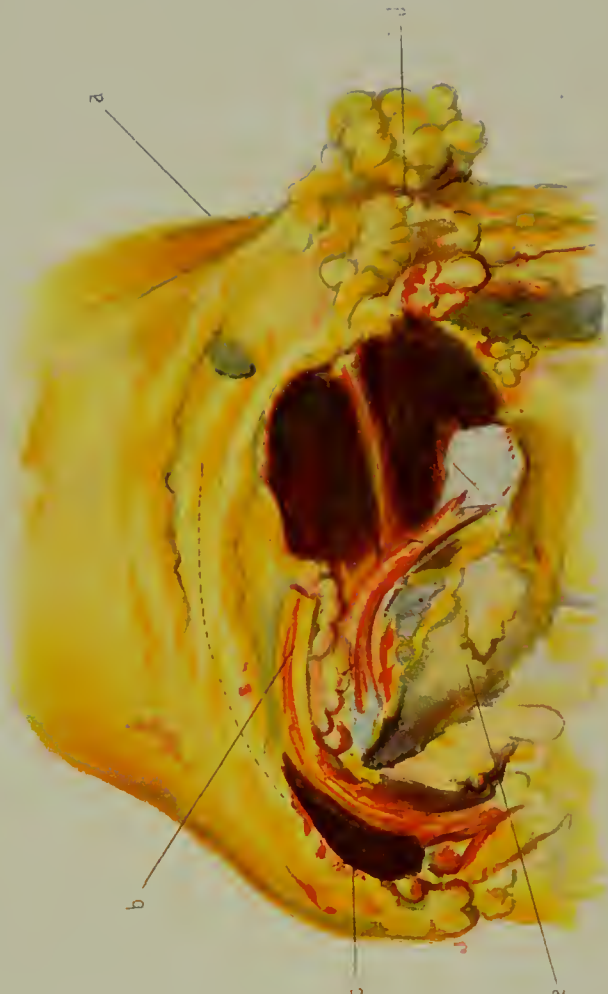
- a a* The Shank.
- b b* The Pelvic or Aitch Bone.
- c c* The Pizzle.
- d d* The Erector Muscle or Root of the Pizzle.
- f f* The Pelvic Cavity.
- g g* The Cod Fat.
- h* The Kidney Fat.
- i i* The Peritoneum.

The kidney fat of the bull from which this drawing was made was so small as to be hidden by the vertebræ.

EXPLANATION OF PLATE IV.

This is an enlarged drawing of the pelvic region of an ox and bull, showing the relative sizes of the different parts.

- a a* The Pelvic Bone.
- b b* The Pizzle.
- c c* The Erector Muscle.
- d d* The Cod Fat.
- e e* The Pelvic Cavity.



BULL.



TABLE I.

HIND QUARTER.

*Ox.**Bull.*

- | | | |
|--------------------|---|---|
| 1. Erector Muscle. | A patch of lean meat about 3 in. in length by 1 in. in breadth, situated at the root of the pizzle. It is not always so apparent as that in the sketch. | About the same length as in the ox, but much broader. It is also much coarser in texture. |
| 2. Pizzle. | Very much thinner and smaller than in the bull. | Largely developed ; is often split and partly removed in order to make it appear of the same size as that of the ox, or entirely removed, and the retractor muscle left in. |
| 3. Pelvic Bone. | Moderate in size ; should show bluish gristle in an animal under six, if it has been severed with the knife, and not sawn through. | Very large and massive, except in very young animals. It cannot, as a rule, be cut through with a knife, and is, therefore, sawn. |

	<i>Ox.</i>	<i>Bull.</i>
4. Cod Fat.	Plentiful ; solid and rounded in form as shown in Plate.	Scanty ; generally shows cavity from which testicle has been removed.
5. Fat.	Plentiful, especially round the kidneys and in pelvic cavity. Peritoneum should also be well furnished, and layers of the same substance interspersed with the lean.	A poverty of fatty covering of the kidney ; pelvic cavity and peritoneum poorly furnished, except in quite young, very well-fed animals.
6. Lean.	Juicy ; smooth, and silky to the touch ; florid in colour, and marbled with fat.	Coarse and stringy in texture ; harsh to the touch, and marbling absent.
7. Muscular Development.	Not marked.	Marked.
8. Bony Structure.	Slighter than in the bull.	Massive, except in very young animals.

In cases where the cod fat, pizzle, or erector muscle have been tampered with, meat can at once be rejected,

OX



BULL.



EXPLANATION OF PLATE V.

This Plate represents fore quarters of ox and bull hung so that the difference of size of the crest muscles may be seen at a glance.

The exteriors of the quarters are in deep shade in order to give this point more prominence.

a a Crest Muscle or Collar.

EXPLANATION OF PLATE VI.

The object of this plate is to show the difference between the fatty covering and muscular development of a fore quarter of ox and that of a bull.

a a Crest.

b b The dotted line shows where the quarter would be cut in order to remove the crest in the hope of passing the remainder as ox beef.

OX.



BULL.



as it is a suspicious circumstance, and is directly contrary to the specifications of contract.

The only exception to this rule is in refrigerated beef, which is dressed in America, where the pizzle and root are invariably removed.

TABLE II.

FORE QUARTER.

Ox.

Bull.

- | | | |
|----------------------------------|---|--|
| 1. Neck,
Collar,
or Crest. | Can be grasped between the fore-finger and thumb. | Requires at least the whole hand to grasp it. |
| (This is a most reliable guide.) | | |
| 2. Fat. | A plentiful coating on the exterior, coming right to the point of the shoulder. | Exterior coating is almost entirely absent, the lean being directly covered by the outer skin. |
| 3. Lean. | As for hind quarter. | As for hind quarter. |
| 4. Brisket. | Not so coarse, hard, or dark as in bull. | Coarser in texture ; harder and darker in colour than in ox. |
| 5. Bone. | As for hind quarter. | As for hind quarter. |

Inspecting Officers should be particularly suspicious of fore quarters purporting to be ox, heifer, or cow, which have the neck removed, as shown by the dotted line *b—b* in Plate VI. Such fore quarters are almost certain to belong to a bull, as this cutting away removes the chief characteristic of the fore quarter of the bull, viz., the heavy collar or crest muscle. The mere fact that a portion of the quarter has been removed is quite sufficient ground for rejecting the piece, under the clause that beef is to be delivered in quarters.

HEIFER AND OLD COW.

A maiden heifer is one which has not yet had a calf; but the term heifer by itself is often applied to a young cow that has not had *more than one* calf.

Greswell says, in his treatise on "The Diseases and Disorders of the Ox:" "In some of our improved breeds of cattle, especially when well kept and attended to, the animal often conceives when she is little more than a year old." Add the period of gestation in the cow, which is 280 days, and a total of about two years will be arrived at before there is any likelihood of a calf being born; as a rule it will be longer. It will thus easily be seen that there is little or no chance of a cow under four years of age (the limit at which the present contract fixes the age of cow beef) having had more than two calves. This is a most important point, as the number of calves, at all events up to three, that a cow

has had can be determined, with some degree of certainty, by the state of development of the udder and milk duct.

In the "Maiden Heifer" the udder, as shown in the illustration, will consist of a large, smooth, rounded swell of solid fat. If a section be made through it, it will appear—as in Plate VIII—fatty throughout. "In the heifer the udder is but slightly developed ; it is, in fact, enveloped in fatty tissue, and forms a uniform thick wall on either side of the flank"—(Walley).

When a cow has had one calf the surface of the udder will be slightly soft, but the main portion will still consist of solid fat.

After the second calf the udder will be composed of about one-half of spongy substance, and the other half of firm fat.

When the number amounts to three or more the udder will be found to be spongy throughout, becoming looser, more spongy, and browner as the number increases.

There is a practice of first cutting away the udder altogether while the carcase is warm, and then pulling the skin cleverly over the excised part. An attempt is then made to give it the appearance of the udder of the heifer by skewering it in several rolls (as in Plate VIII), or to imitate the cod fat of the ox.

This trick can at once be detected by removing the skewers. A hind quarter tampered with in this manner should invariably be rejected as contrary to contract. This practice is never resorted to unless the animal has had more than two calves, so it is safe to conclude that the animal is beyond the limit of age. Sometimes the

udder is only partially cut away, but an examination of the part will enable an inspecting officer to at once detect this practice. Should any doubt exist as to the firmness or otherwise of the udder it should be cut through, when it will be found to agree more or less with one of the sections described, and the quarter should be rejected or accepted accordingly. Young cows are rarely killed purely for market purposes, as, if in good health, they are of far greater value as dairy animals.

The general conditions of youth, as already set forth, are apparent in the heifer and young cow.

The pelvic bone of the old cow is unmistakable. As the age increases the portion nearest the udder gradually wears away and becomes narrower, while that nearest the haunch generally broadens considerably. The fat of the old cow is usually of a brighter yellow than that of young animals, though this fact, unsupported by other evidence, is not sufficient cause for rejection, as it may be attributable to breed or feeding.

In the fore quarter the chief indications that the animal is old are bleached ribs, want of fat on the ribs and pleura, a very prominent scapula or shoulder bone, with a hollowness or falling away on either side of it, which gives a concave or "shelly" appearance to the quarter. The brisket will often be found narrower at the point indicated in Plate IX than in a fore quarter of ox or heifer.

The lean of old cow beef is less juicy, darker in colour, and more stringy and coarse in texture than that of a young and well fed animal. There is a want of marbling

of fat in the lean, and the fat streaks are poor or absent altogether.

The following tables, III. and IV., which should be carefully studied with the plates, show the points which distinguish heifer and young cow beef from old cow :—

EXPLANATION OF PLATE VII.

This Plate represents hind quarters of heifer and old cow.

- a a* The Shanks.
- b b* The Pelvic Bone.
- c c* The Udder.
- d d* The Pelvic Cavity.
- e e* The Kidney Fat.



OLD COW.



UDDER OF HEIFER.



OLD COW (Seat of Udder skewered over).



EXPLANATION OF PLATE VIII.

This Plate shows the appearance of the udder of a heifer when cut through, and also the way in which the skin is skewered after the removal of the udder in the case of an old cow.

a a Pelvic Bone.

TABLE III.

HIND QUARTER.

<i>Points.</i>	<i>Heifer and Young Cow.</i>	<i>Old Cow.</i>
1. The Udder.	Firm in the heifer, half fat and half soft in a cow that has had two, but not more calves.	Soft, spongy, and brown in colour throughout.
2. Pelvic Bone.	As in illustration.	Thin at the end nearest the udder ; broad at the other.
3. Pelvic Cavity.	Normal.	Distended.
4. Meat.	As for young ox.	Coarse and stringy to touch, dark in colour, with an absence of moisture.
5. Fat.	As for young ox.	Not abundant ; generally yellow in colour.
6. Belly.	Normal.	Generally distended.

FORE QUARTER OF OLD COW.



EXPLANATION OF PLATE IX.

This Plate represents the exterior of a fore quarter of old cow.

The difference between the fore quarter of an ox and that of an heifer is so slight that it could not well be represented in a drawing. This Plate should, therefore, be compared with the fore quarter of ox in Plate VI.

a The Scapula or Shoulder Blade.

EXPLANATION OF PLATE X.

The object of this Plate is to show the different appearance presented by the interior of fore quarters of young well-fed animals and those of old ones.

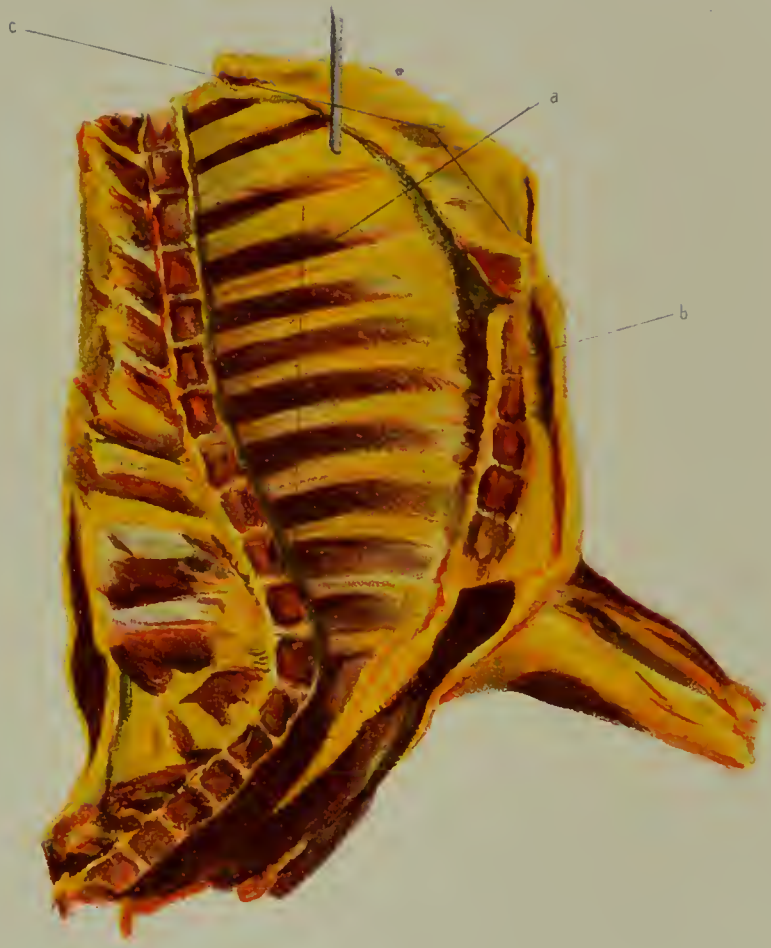
In the heifer the pinkness of the ribs and the fat on the pleura should be noted, whereas in the old cow the ribs are bleached and the fat is wanting.

a The Pleura.

b The Brisket.

c The Diaphragm or Thin Skirt.

HEIFER.



OLD COW



TABLE IV.

FORE QUARTER.

*Heifer and Young Cow.**Old Cow.*

- | | | |
|---|-----------------------------|---|
| 1. Ribs. | Show the pinkness of youth. | Pinkness will have faded away usually by the fourth or fifth year. The ribs will be white, becoming more bleached as the age increases. |
| 2. Scapula,
or
Shoulder
Blade. | Not prominent. | Very prominent, and there is a "shelly" concave appearance on either side of it. |
| 3. Brisket. | As in young ox. | Generally narrower where line $x-y$ is drawn than at the same place in ox or heifer. |
| 4. Fat. | As for young ox. | As in hind quarter. |
| 5. Lean. | As for young ox. | As in hind quarter. |

REFRIGERATED BEEF.

Refrigerated beef, often erroneously classed as "frozen beef," arrives in this country in large quantities from North America. The ships employed for its conveyance are fitted up with chambers specially constructed for the purpose. The meat is wrapped in thin canvas and hung up in these chambers, through which a current of cold air is continually passing. This air is pumped into the chambers, and, so to speak, poured over the meat at such a temperature as to keep the carcasses a few degrees above freezing point, but never to allow them actually to freeze. By this means the process of decay is suspended to such an extent that the meat arrives in England practically unchanged.

This meat is of the same description as that produced by live cattle imported from America, and slaughtered in England. Although it does not command quite so high a price as prime meat of animals bred in England, it is almost equal to it in quality.

During the past two years refrigerated beef has undergone a fair trial, and it has given almost universal satisfaction. As, however, during the summer months it decomposes more rapidly than meat freshly killed, it has been decided not to accept it for issue during certain months of the year, which are specified in the "Conditions of Contract."

Refrigerated beef differs slightly in appearance from fresh. The following are its chief characteristics:—

1. The shanks are bruised and discolored owing to the chain which is passed round the hind legs during process of slaughtering.

2. A general pinkish tinge extends over the whole of the carcase.

3. The gristle of the joints is pinkish instead of bluish in colour.

4. The dressing is not so clean and neat as in English dressed meat, and the pizzle and root are always entirely removed.

5. The carcase is cold to the touch, and stiff, the outer surface, more especially the flank, being damp and "sweaty."

6. The streaks or layers of fat when a section of the flesh is made will be found to be of a pale pink colour instead of white. This is caused by the juice of the lean soaking into the fat.

7. The lean itself will be somewhat pale in hue and more of a brick colour than the bright, rich red of home-killed beef.

Sometimes the shanks are very much lacerated, and if the contractor declines to remove the injured portion the whole quarter should be rejected.

Besides being objectionable in appearance, bruised meat will soon become tainted.

Refrigerated beef is as a rule tendered for inspection wrapped in the cloths in which it was enclosed previous to its departure from America. On the removal of the cloth a slightly unpleasant smell is sometimes discernible, but care should be taken not to reject the meat without further examination, as the smell may only be a surface

one caused by the cloth. When this is removed the quarters, fore and hind, should invariably be cut through in the ordinary manner, when, if any taint exists, it will be easily detected.

One great advantage possessed by refrigerated meat as a whole over English-killed meat is that, owing to the fact that it would never pay to send over anything but meat of fine quality, the inspecting officer may be certain, when he has satisfied himself as to its freedom from taint, that he has a good article. It is never of inferior quality—wanting in fat or lean; and, since it should not be accepted during the months specified in the contract for its exclusion, the danger of taint is very slight.

FROZEN BEEF.

Frozen beef, which is imported mostly from Australia and South America, is not at present received for issue to the Army.

Before being thawed it is easy to detect frozen meat, from its cold, hard touch. A saw has to be used even to cut the fat or lean.

It is, however, never likely to be tendered in this state, as its detection would be too simple. In a thawed or semi-thawed state it may be detected by the following characteristics :—

The fat is of a deadly white colour. The flesh has a uniform pink appearance, owing to diffusion of the colouring matter of the blood. The whole has the appearance of having been soaked in water, and there will be an oozing and dripping of a watery liquid from the carcase. Should it, however, have been kept so long a time as to have lost its outward moisture, it can easily be recognised by a general dull, parboiled, "dirty" appearance, and on a fresh section being made the watery condition will again be apparent.

HORSE FLESH.

"The muscular tissue of the horse is much darker in colour than that of the ox, and it is coarser in texture ; in flavour it is on the whole superior, but the odour is less pleasant.

"The fat is always of a yellowish colour, and softer, and it has a rather unpleasant sickly taste, due probably to the fact that it contains more margarine than does the fat of the ox.

"After the lapse of a few days, horse flesh contracts a peculiar sickly odour, and soapy feel, which is familiar to all who have been in the habit of dissecting. * * * The bones of the horse are relatively much larger than those of the ox ; they contain more fatty matter, which is of a semi-fluid consistency. The prominences, processes, or projections at the ends of the bones are more numerous and larger. The ribs of the ox are

fewer in number than in the horse, but they are much less arched ; they are broader and flatter"—(Walley).

The horse has eighteen pairs of ribs while the ox has thirteen. The tongue and the heart present a marked difference in the two animals, but as they are not likely to come under observation, it is needless to describe them.

As the butcher would not be likely to tender a fore-quarter with more than the number of ribs possessed by the ox, the points to be chiefly relied on are:—The colour and smell of the flesh, the oily nature of the fat, the size of the bones, and the marrow contained in them, which consists of an oily kind of fat, instead of the firm marrow of the ox.

WETHER.



EWE.



EXPLANATION OF PLATE XI.

This Plate represents the difference between a wether and a ewe.

a The Cod Fat.

b The Udder of the ewe—the point to which the pizzle extends in the wether.

The dotted line in the latter shows where the pizzle is usually dressed.

GENERAL REMARKS ON MUTTON.

The mutton supply may be divided as follows:—

- (A) *Animals bred and killed in the United Kingdom.*
- (B) *Those imported from Germany.*—This class is now imported in large quantities, and has of late so much improved in quality that it is impossible to distinguish it from English.
- (C) *Frozen Mutton.*—Brought chiefly from New Zealand, Australia, and South America. The latter is more fully described at page 43.

The illustrations show clearly the difference between the sexes. The chief characteristics of good mutton are almost the same as in beef; the general indications of youth and age are precisely similar. The flesh is less florid in colour than that of the ox. If young, and well fed, it will present the same marbling of the fat as good ox beef. The fat is always very firm, and white in colour.

The question of fat in mutton is one that requires some attention. The greater part of the mutton tendered is too fat, the proportion of fat to lean being so great as to nearly always give rise to complaint.

There is a very simple way of detecting the amount of fat on a carcase without cutting it through. This is, to look at the shoulders where marked *o—b* on Plate XII. If a bluish tinge is discernible, the proportion of fat is not too great. If, on the other hand, this tinge, which is in reality the lean showing through the covering of fat, is absent, the carcase is too fat, and the

butcher must be ordered to strip off some of the covering of the back, as well as the surplus fat about the kidneys. It is best to personally see this done, otherwise only a very superficial trimming will take place. Should the contractor refuse to remove the surplus fat, the carcase must be rejected.

Sheep under 50 lbs. weight are not received, because any tendered for issue under that weight are likely to be of inferior quality.

The bloom, or colouring on the back, should have a bright healthy appearance, and be of a red colour with a slight tinge of yellow, which is deeper in rams.

Should the back present a generally discolored and veined appearance, it is probably the result of age and want of condition, and the meat should be rejected.

The signs of a fevered and dropsical condition mentioned in the General Introduction in connection with beef also occur in mutton from like causes.

The cavity of the chest should also be examined as in the ox, to detect adhesions, stripping, or tubercles.

EXPLANATION OF PLATE XII.

This Plate shows the difference between the muscular development of a wether and that of a ram or "tup" sheep. It also gives the general appearance and colour of healthy well-fed animals.

- a a* Chump end of the loin, where the stripping of excessive fat should commence.
- b b* The point where the bluish tinge, showing that the animal is not too fat, should be looked for.
- c c* The Scrag.

WETHER.



RAM.



PORTIONS OF PIZZLES

OF

RAM

AND

WETHER.



FIG 1.



FIG 2.

RAMS AND WETHERS.

The difference between a ram or "tup" sheep and a wether is at once apparent if the specifications of contract as to dressing are complied with. The guiding features are:—

1. *The Pizzle*.—This as a rule is dressed on the left side, but may sometimes be found on the right. The amount left in is much greater than in the ox, and should extend from the root as far as shown by the dotted line at *b* in Plate XI. The butcher should invariably be made to show it. If he is unable to do so the carcase must be rejected, except in the case of frozen mutton, which is noticed hereafter. The pizzle once produced there can be little doubt as to whether the animal is a ram or a wether. In the former case the string will be of about the thickness shown in Fig. 1, and in the latter of that shown in Fig. 2 (Plate XIII).

There are a certain number of imported sheep which, instead of being castrated in the English manner, have been tied. These present the general characteristics of the ram, and stand much in the same relation to it that the "stag" does to the "bull." They should be rejected accordingly.

2. *The Scrag or Neck*.—This in the ram will be very broad and massive as compared with that of the wether or ewe; the relative sizes may be seen by a glance at the illustrations. The scrag of course answers to the crest of the bull, and the butcher may remove it and attempt to pass the remainder of the carcase as "contract"

mutton in the same way that he sometimes cuts off the neck of the bull and thinks that by so doing he has obliterated all sign of its identity. Carcasses of mutton mutilated in this fashion should be rejected without a moment's hesitation.

In addition to the two main points given above the bones, especially those of the forearm, will be larger, the flesh darker in colour, and the erector muscle more marked in the ram than in the wether. As regards the age of wethers, there is little chance of meeting with one over four years, or even that age, as the demand, in spite of the amount of mutton imported, has of late years got so far in advance of the supply that the breeder can seldom afford to keep them till they are older.

EWES.

No limit of age above which ewes are to be rejected is laid down in the contract. As, however, the flesh of old ewes that have had many lambs is innutritious, and in all respects inferior, it may be rejected. Such sheep can usually be brought under the heading of "ill-fed," as the lean and fat are of poor quality, and small in quantity.

In old animals the surface of the kidney-fat and also the back will be much veined ; the knuckle joints, instead of exhibiting the pinkish-blue colour of young animals, will be quite bleached ; and if the skin on the back and sides, instead of being bright and healthy, is of a drab colour, it may safely be assumed that the animal is old and of inferior quality.

FROZEN MUTTON.

Frozen mutton has many of the same peculiarities as frozen beef, and, in addition, will exhibit a fading of the exterior bloom ; but, if in good condition, it is excellent meat and is in accordance with the conditions of contract.

The reason for the acceptance of frozen sheep and the rejection of frozen beef is that the carcasses of the former are frozen whole ; consequently there is not the same loss of nutrition arising from the flowing of liquid from a cut surface as is the case with the latter, which is almost always frozen in sides. Beef is cut into many more joints than mutton, and this, combined with the fact that the vesicles are much larger, causes a greater loss of nutritive properties.

If meat is subjected to the freezing process before the natural warmth (animal heat) has left the body, the outside only becomes frozen, and the interior, being quite unaffected by the process, rapidly putrefies. Thus, though the outside may be perfectly good and sound, putrefaction may exist in the interior or unfrozen parts.

Frozen mutton should therefore invariably be carefully examined, by cutting clean through at the pelvic bone and at the thickest part of the leg, when, should there be anything wrong, it will be sure to be observed upon one or both of the surfaces exposed. It is in consequence of the difficulty of extracting the animal heat from the internal organs, that it is customary to remove the kidneys from mutton before subjecting it to the freezing process.

The pizzle is in many cases removed. This is not sufficient ground for rejection, as the contract only specifies that the pizzle should be left in in the case of animals killed in the United Kingdom.

There is little probability of meeting with frozen rams, as they are kept in their native land for stock purposes, and when for any reason slaughtered, are usually disposed of on the spot.

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GOAT FLESH.

“The flesh of the goat is, in adult animals, much darker in colour than that of the sheep, and it is less abundant ; but there may be equally as much fat on the bones in the former as in the latter. When newly dressed, and when subjected to the action of heat, the flesh of the goat gives off a distinct goaty odour, and it has also a goaty flavour”—(Walley).

In addition to the above the backbone is generally raised and prominent, the bark or skin is of a dark red colour, and the shank and leg bone are small compared with those of the sheep.

Goat flesh should not, of course, be accepted.

REMARKS ON THE CONDITIONS OF CONTRACT
AT HOME.

Quality.—"Well-fed, good, sound, sweet, and wholesome." As regards the term "well-fed," the size of the bony structure must be considered, and care taken that the fat and lean are in proportion to it. It is impossible to lay down any hard and fast rule as to what a quarter of beef should weigh, owing to the difference of size between different breeds of cattle, but the following may be taken as a general guide:—

A well-fed quarter of ox should, ordinarily, weigh not less than 150 lbs.

A well-fed quarter of heifer, or young cow, should, ordinarily, weigh not less than 135 lbs.

A quarter of Kerry, or Alderney, heifer would probably weigh less than the above, and yet be well-fed; but these animals are not often met with, being valuable for dairy purposes. On the other hand, a quarter of a big, gaunt, bony beast might just scale the above weights, and yet not be up to the mark as regards feeding.

Dressing.—The carcasses should be dressed as shown in the plates, exception being made in the case of refrigerated beef and frozen mutton, which are the only class that should be recognised as killed out of the United Kingdom.

In Scotland the pizzle is often left intact; and, as of course this includes the root, it is in accordance with the contract. Care must be taken not to mistake the retractor muscle (which apparently comes from the top

side of the root muscle, and is sometimes dressed along the dotted line drawn in Plate XI.) for the pizzle.

Excessively Fat Meat.—In beef, fat in excessive quantities will only be found in the pelvic cavity and round the kidneys of the best-fed animals. If the inspecting officer considers that the fat is out of proportion to the lean, and it cannot conveniently be used for cooking purposes, he may order its removal from these parts, and also have the cod fat or udder cut off if unusually large. Officers must be careful to use this power with discretion.

Quarters and Carcases.—No exception should, if possible, be allowed to the rule that beef is to be delivered in whole sides or quarters and mutton in carcasses.

Officers in command of small detachments should be most careful to see that the butcher brings all portions of the carcase in turn, otherwise the inferior parts (such as the thin flank, brisket, clod and sticking piece) will appear time after time.

It is suggested that the butcher should be made to bring half a quarter at a time, for instance:—

First day: The top piece (this comprises the thick flank, buttock, and aitch bone).

Second day: The remainder of the hind quarter—viz., the rump, loin, and thin flank.

Third day: Half the fore quarter, fore rib, middle rib, and part of the brisket.

Fourth day: Remainder of fore quarter—that is, clod and sticking, chuck and leg of mutton piece, and remainder of brisket.

An arrangement of this kind will ensure the whole of the joints being obtained in turn, and, owing to the meat being delivered in pieces of fair size, will give a fair opportunity of judging its quality. On no account should meat be received "in bits."

It is strongly recommended that when the time of year allows of keeping, whole sides or quarters only be taken, the amount required for the day being issued from these, and the remainder kept for the next, and even a third day's issue.

While on the subject of cutting up it may be as well to caution officers against unsuspicious-looking baskets, often covered by a cloth, which on closer examination will be found to contain all sorts of odds and ends of inferior parts. Unless a careful watch is kept these may be surreptitiously introduced into the issue as the cutting up proceeds. To prevent this and similar frauds the regulations direct that an officer should invariably be present during the whole issue of rations.

The place where the legs should be cut through is clearly shown by the chain dotted lines in Plate I. In some of the illustrations the hocks have been left on for convenience of hanging, and the fore-legs are shown cut according to the custom of the trade, and not according to contract.

In the carcasses of mutton, shown in Plate XII, the heads and shanks have been removed at the proper place.

If the kidneys have been removed, a cavity will be found at the lower part of the kidney fat, in which case the fat must also be taken away, unless the troops require it.

Meat for Hospitals.—If the contractor for the troops and for the hospital is one and the same man, he should on no account be allowed to cut off for the use of the latter the prime portions from the meat tendered for the former. He is paid a higher price for meat for the hospital, and should provide separate joints.

Inspection.—The Officers acting on behalf of the G.O.C. may be the O.C. Troops of the Station, or any Officer appointed by him, or by the G.O.C., to inspect.

In the case of rejection it is not compulsory to give the contractor the option of replacing the meat.

Default.—If the contractor fails to supply meat at the appointed time, or if a rejection takes place, and it is found impossible to purchase fresh meat in default, and there are no Government Stores within reach, preserved or salted meat may be purchased, and the contractor held liable to pay all costs and charges attendant on its purchase.

Cutting up by the Troops.—The 1 per cent. allowed for this purpose may, for convenience, be calculated as follows :—

From	1	to	50 lbs.	...	nil.
„	50	„	150 lbs.	...	1 lb.
„	150	„	250 lbs.	...	2 lbs.
„	250	„	350 lbs.	...	3 lbs.

and so on.

The accompanying diagram will show, roughly, the joints into which beef is usually divided, together with their several names, and, by comparing it with the coloured illustration, an idea may be formed of their appearance.

The following will also be found useful in identifying them :—

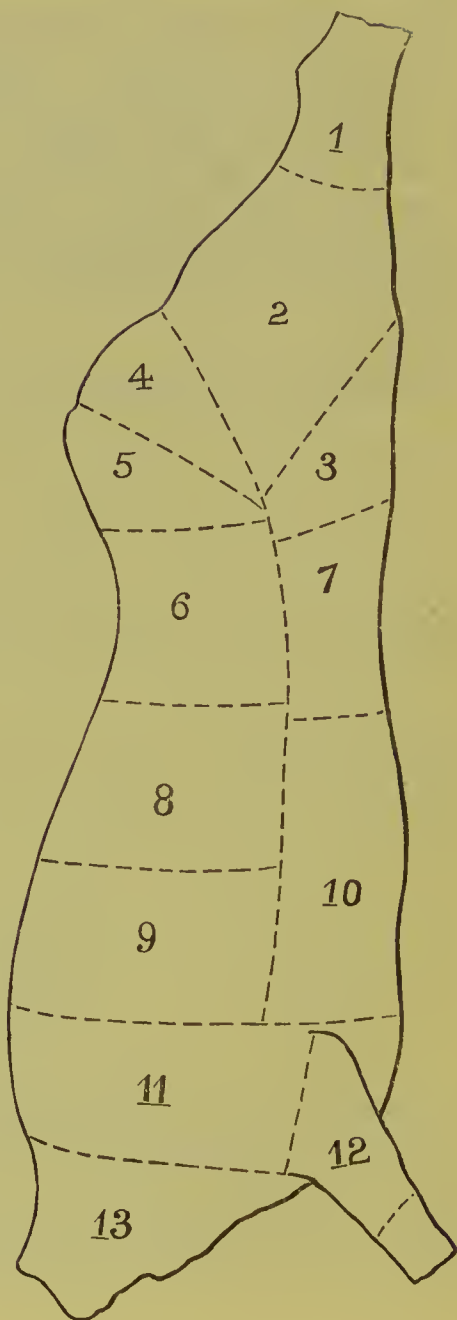
The buttock is composed of two portions, the top side, and the under or silver side. The former should contain part of the pelvic bone, and the latter the thigh bone. The thick flank has the socket of the stifle joint.

The aitch bone includes a small portion of the pelvic bone, and, in the male animal, the root of the pizzle.

The rump is from the tail to the first joint of the loin.

The loin, as a rule, has only one rib attached.

1. The Shank.
2. The Buttock.
3. The Thick Flank.
4. The Aitch Bone.
5. The Rump.
6. The Loin.
7. The Thin Flank.
8. The Fore Rib.
9. The Middle Rib.
10. The Brisket.
11. The Chuck and Leg
of Mutton Piece.
12. The Shin.
13. The Clod and Stick-
ing Piece.



The thin flank is really only the outer covering of the belly.

The fore rib comprises the six ribs next to the one found with the loin.

The middle rib is the name given to the next four, and the chuck to the remaining two ribs. The outer and more fleshy side of the chuck ribs is called the leg of mutton piece, and should include the socket of the shoulder.

The brisket has already been pointed out.

The clod and sticking piece is simply the neck and gullet.

The names are those used in the London market, but they vary slightly, as does the cutting of the joints, in some parts of the provinces.

In the case of a rejection made on account of age no proposal to bring the head should be entertained for a moment, as the age of a head unattached to a carcase cannot possibly be any proof as to age of the latter. Should however undoubted evidence exist that a head belongs to a body the age may be told by the teeth of the under jaw.

The small teeth seen in the one year old are shed two by two each year, and the second or larger teeth appear in their place.

A two year old will thus have two large teeth in the centre, and three small ones on each side.

A three year old will have four large teeth in the centre, and two small ones on each side.

A four year old will have six large teeth in the centre, and one small one on each side, but often has a "full mouth" if well bred and well fed.

A five year old will have a "full mouth," or eight large teeth.

After the fifth year the age must be estimated by the extent to which the teeth are worn away.

All the points which are likely to be of assistance to officers in judging meat have now been touched upon. Should further information be required "A Practical Handbook for Officers supervising Meat Contracts," by Chief Inspector Wylde, and "Meat Inspection," by Professor Thomas Walley, M.R.C.V.S., Principal of the Royal (Dick's) Veterinary College, Edinburgh, will be found to deal at length with the subject.

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